to about 330 kilowatts at maximum load, or about 260 kilowatts under ordinary normal load. The sidewalk was usually in operation between the hours of 10 A.M. and 7 P.M. The direct current was generated by a 600-kilowatt Westinghouse generator coupled directly to an 850 horse-power multiphase induction motor supplied through transformers from 5,000-volt mains leading to the power house at Issy-le-Moulineaux.

The sidewalk was very popular and effective. It has shown that where sufficient space can be obtained, large crowds can be successfully carried at low speeds to a limited distance at a low expenditure of power per individual. On the other hand, however, the method would be very wasteful and costly where only a small number of persons has to be carried. No seats were provided on the platform, and beyond the fencing, the only objects rising above the platform levels were vertical wooden posts about 3 feet 6 inches high, terminating above in a wooden knob to aid persons in passing from one platform to another.

Mining and Metallurgical Section.

Stated Meeting held Wednesday, December 12, 1900.

TALLOW CAVE, NORTH DORSET, VT.,

AND

MARBLE NATURAL BRIDGE, NORTH ADAMS, MASS.

By Edwin Swift Balch, Member of the Institute.

Tallow Cave is situated on Dorset Mountain, southwest from North Dorset, Vt. It is about fifty minutes' walk distant from the railroad station, up a rather steep and rough mountain road. I visited it with my brother and one of the natives of North Dorset, on September 25, 1900. There is a sort of ravine with a little bluff at the top; under this is the cave. The entrance is low and narrow, just large enough to pass through easily, and the wall of the cave goes down

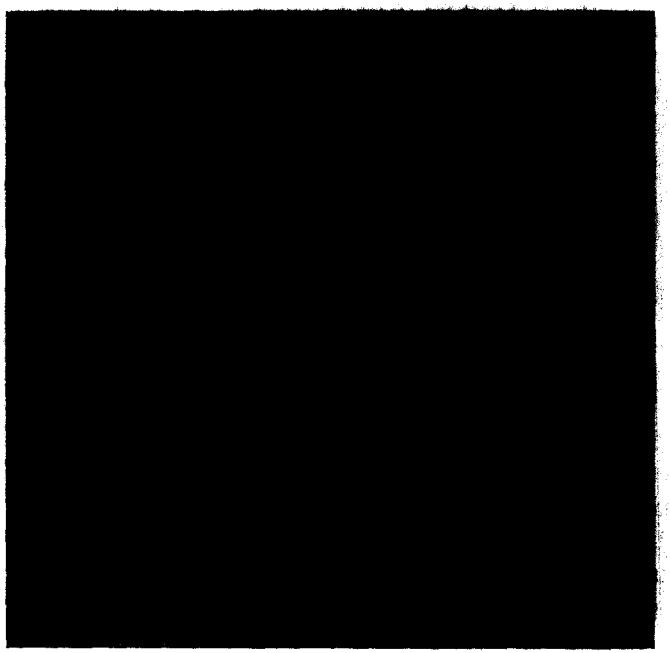
steeply for about 5 meters from the entrance. On this wall we found, fortunately, a rough ladder of two birch poles, with twelve rungs. At the bottom of the wall is a chamber some 4 meters wide and 6 or 7 meters long, which turns to the right and narrows towards the end. Here there is a pit some 4 meters deep, which forms a second and lower chamber, into which we could not descend, as there was no ladder; by throwing down some burning birchbark, however, we could see that it was small.

The noteworthy feature about Tallow Cave is the mineralogical formation from which it obtains its name. The rock is a coarse white marble, which, at the entrance, seems as hard as other marble. Inside, 4 or 5 meters from the entrance, the walls, the roof and the floor might almost be described as soft. They are formed of, or covered with, a sticky, compact, whitish substance, not unlike putty in its consistency, and which can be cut out in lumps with a penknife. It certainly resembles tallow, only it is more solid. There are neither stalactites nor stalagmites within the cave, and, judging from my one visit, the temperatures are normal and there is no very abnormal excess of moisture. Mr. Thomas H. Garrett, the analytical chemist, and Dr. William H. Wahl have kindly analyzed samples of the "tallow" for me, and they report that it is carbonate of lime. It is, in any case, a rare formation, for I have visited perhaps a hundred caves and never seen anything like it.

I find, however, in M. Martel's recent book, "La Spéléologie," that a similar or, perhaps, identical substance has been found in three caves in Europe, and that it is called *mondmilch* (moon-milk), a name given by the Swiss peasants near Mount Pilatus, where it was first discovered. These European caves, however, are of ordinary limestone, while Tallow Cave is of marble, so that the "tallow" there is at any rate unusual. The explanation given by M. Martel is that *mondmilch* is carbonate of lime so thoroughly saturated with water that it cannot harden into stalactite.

Not far from Tallow Cave a deep sink hole called Purgatory is reported. After a careful and fatiguing search

through the dense forest, I am sorry to say that we were unable to locate it, although our guide professed to know the mountain. It is described as a funnel-shaped pit, in whose base is a vertical hole of unknown depth; and when big stones are thrown in they can be heard falling for several seconds. It must be a regular *aven*, as these pits are called in the limestone regions of Southern France. I have no doubt of the existence of this Purgatory, for we discovered



Natural bridge of marble, North Adams, Mass.

on Dorset Mountain two small holes which went down vertically out of sight, and also a large pit, perhaps 6 meters in length by 4 in width and 5 in depth, whose sides are nearly sheer.

In the town limits of North Adams, Mass., is a remarkable natural bridge, which I visited last October. It is close by the Beaver quarry, whose marble is used in the manufacture of soda water. The bridge spans a little winding canyon, which has been cut out by water and

whose marble edges are rounded off, forming hollows and basins such as one sometimes sees in mountain streams. The bridge is of marble, and is about 4 meters long, 3 meters broad and some 3 meters thick. The canyon under it is 4 or 5 meters deep. Both in formation and appearance the bridge is entirely different from the one in the Shenandoah Valley or the little one on Cranberry Island, Me., the only others I have seen. Natural bridges at best are rare phenomena, and the one at North Adams is unique, as far as I know, in being formed of a true marble.

Stated Meeting, held Wednesday, December 12, 1900.

SUBTERRANEAN WATERS.

By Charles Morris.

The crust of the earth is only in a general sense a solid mass. In many localities it might be compared to a sponge, full of cavities and ramifying passages, and freely permeable to liquids. While in many places it is composed of dense rock or firm clay, through which water cannot make its way, in others it is rent and splintered, and large cavities here and there exist. Again, much of the material of the crust is porous, water passing somewhat freely through it, and in other localities water makes its way by a process of solution, dissolving and carrying off certain constituents of the rocks. As a result of this permeable condition much of the water which falls upon the earth's surface makes its way into the interior, penetrating the pores and cavities of the crust, which seems to be fully saturated with water.

What may be the actual quantity of water thus held in the earth's crust it is far beyond the present power of science to decide. It must be very great, since, in addition to the free liquid, water exists as a constituent of the hardest rocks. If restored to the surface it would doubtless be sufficient to raise considerably the ocean level, and perhaps to flood all the lower portions of the dry land. In that